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Letter to the Editor

Is there any effect of probiotics on allergic airway disease?

To the Editor,

I read the article by Tang et al entitled 'Can probiotics be used to treat allergic diseases?' with great interest.[1] Subsequent to my review, I deemed it necessary to contribute my opinion regarding some of the conflicting issues mentioned in the article. The authors did not point out several of the probiotics' effects on the mechanisms affecting allergy development. For instance, their direct effect on the maturing gut barrier (intestinal mucosa structure/function) and development of tolerogenic dendritic cells resulting in transformation of the local intestinal and systemic immune response.[2] These favorable effects elicited by probiotics in allergic children are consistent with the current concept of "nutritional immunology",[3] which explains not only the treatment of allergic symptoms but the concept of developing tolerance as well.[4] These and other related mechanisms are explained in detail in one of our articles.[2]

The role of probiotics on allergic airway diseases e.g., asthma and allergic rhinitis (AR), remains controversial. As stated in the article, none of the primary prevention studies demonstrated that probiotics have any effect in the development of asthma in humans.[1] However, there are also several studies which reportedly did show the therapeutic effect of probiotics on asthma management. In a randomized, placebo-controlled, double-blind pilot study, 17 children aged 6–12 years with intermittent or mild persistent asthma were enrolled. There were eight patients who received laser acupuncture treatment for 10 weeks and probiotic treatment (*Enterococcus faecalis*) for 7 weeks. This interactive treatment of probiotics demonstrated a beneficial clinical effect on bronchial hyperreactivity, and could be helpful in the prevention of asthma exacerbations.[5] In another randomized, double-blind, placebo-controlled study of school children (age 6–12 years) with asthma and AR, the aim was to determine whether daily supplementation with specific *Lactobacillus gasseri A5* for 8 weeks can improve the clinical symptoms and immunoregulatory changes. The pulmonary function and clinical symptom scores for asthma and AR improved. Additionally, significant reduction in the TNF-α, IFN-γ, IL-12, and IL-13 levels were also shown.[6]

The authors indicated that there was no significant change in blood or immunologic parameters of AR in the probiotic groups of the PubMed database.[1] As mentioned above, there are quite a few studies demonstrating significant change in blood and/or immunologic parameters of AR patients supplemented with probiotics. Intranasally delivered probiotic mixture *VSL#3* prevented the development of *Parietaria* major allergen-specific response, by downregulating Th2 responses at the local and systemic level.[7] Consistent with this study, intranasal administration of *Lactobacillus plantarum* suppressed allergen-induced Th1 and Th2 immune responses (both IFN-γ and IL-5 production) in house dust mite Der p1-sensitized animals.[8]

Another issue regarding the safety of probiotics is data from the literature, that suggest authors have insufficient proof to support the safety of probiotic use in healthy newborns.[1] The safety of *Bifidobacterium lactis* has been established in newborns and in vulnerable infants, e.g., preterms, malnourished, and infants born to mothers with HIV disease. Additionally, *Bifidobacterium* lactis is the only probiotic that has undergone Food and Drug Administration evaluation for use in commercial infant formulas.[2,9] Moreover, *Lactobacillus GG* is one of the probiotics with the greatest volume of clinical and experimental evidence regarding its possible effects on pediatric allergic diseases. *Lactobacillus GG* has a history of safe use exceeding 25 years, which includes administration to preterm infants.[4] *Lactobacillus GG* also appears to generally be safe as an appropriate probiotic for older infants and children.[2] In conclusion, the need to select the most beneficial probiotic strain (dose and timing of supplementation) as well as the susceptible subgroups of allergic diseases, still need to be determined.

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